

IN THE CLAIMS:

This listing of claims will replace all prior versions, and listings, of claims in the application:

1-28. (Canceled)

29. (Currently amended) A DC magnetron sputtering apparatus for manufacturing a photomask blank comprising:

a vacuum tank;

a sputtering target whose surface is directed downwards with respect to a gravity direction;

a magnetron cathode with the target attached thereto;

a substrate holder disposed opposite to said target; and

a shield disposed on an inner wall of a vacuum tank inside the vacuum tank surrounding said target and having an inner surface continuously extending away from said target,

wherein said magnetron cathode is a whole-surface erosion cathode, and said shield has a shape such that a position on the shield in the vicinity of the target and the target is of a sufficiently long distance t in the following equation (i) so as to prevent a relative film formation speed on the shield from being larger than that on the substrate:

$$t = \cos\theta_1 x \sin(\theta_1 - \theta_2) / r^2 \quad (i)$$

(in the equation (i), r denotes a distance between a target center and a shield position, θ_1 denotes an angle of a line connecting the target center to the shield position with respect to a normal of a target plane, θ_2 denotes an angle of a shield plane with respect to the normal of the target plane, and t denotes the relative film formation speed in the shield position defined by r and θ_1 .)

30. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

further comprising a shield for the non-sputtered area on the target.

31. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

wherein said target has a non-sputtered portion whose surface is roughened.

32. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 31,

wherein said non-sputtered portion is an end surface.

33. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

wherein the target has a curved corner surface.

34. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

wherein the shield is kept at a constant temperature.

35. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

wherein said shield has a curved corner surface.

36. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

wherein said shield has a surface which is roughened.

37. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

further comprising a backing plate to which the target is to be attached,

wherein the surface of the backing plate is roughened.

38. (Previously presented) A DC magnetron sputtering apparatus for manufacturing a photomask blank according to claim 29,

further comprising a shield plate for preventing the film from being formed on a peripheral portion of the substrate.